

FINAL RESPONSE TO COMMENTS  
JANUARY 15, 1996  
OPERABLE UNIT 2 RI REPORT (SEPTEMBER 1995)  
MCAS CHERRY POINT, NORTH CAROLINA

COMMENTS FROM GARY McSMITH, LANTDIV

1. Page ES-1, second paragraph: Add "MCAS Cherry Point was placed on the National Priorities List (NPL) in December 1994. The sites included in this report are now managed in accordance with the Comprehensive Environmental Restoration (sic), Compensation, and Liability Act (CERCLA). The Resource Conservation and Recovery Act (RCRA) Section 3008h Administrative Order on Consent is still in effect as an Applicable or Relevant and Appropriate Requirement (ARAR)." Move "Site 10 is divided by Turkey Gut (a small creek) that flows westward into Slocum Creek." to the third paragraph.

Response:

Agree. Text will be changed, except the word "Restoration" will be replaced with "Response."

2. Page ES-4, third paragraph: The sites were not "removed" from the RCRA program. Rewrite in accordance with the comment 1 above.

Response:

Agree. Text will be changed.

3. Page ES-5, fifth paragraph: "Knowledge of the stratigraphy..." in lieu of "The knowledge of the stratigraphy..."

Response:

Agree. Text will be changed.

4. Page ES-6, first paragraph: Describe the phenomenon of the paleochannel. This paragraph implies that there is a continuous "confining unit" across all of Cherry Point. Clarify that the "confining unit" is somewhat permeable, even under OU2.

Response:

Agree. Text will be changed in the Executive Summary and in Section 3.6.1 - Regional Hydrogeology.

5. Page ES-8, fourth paragraph: List the metals that were detected in 90 percent or more of the samples.

Response:

Metals that were detected in at least 90 percent of the samples include aluminum, arsenic, barium, calcium, chromium, iron, lead, magnesium, and manganese. The text will be changed to reflect this in the Executive Summary and in Section 4.1.3 - Subsurface Soil.

6. Page ES-9, first paragraph: Change "were" to "where" in the last sentence.

Response:

Agree. Text will be changed.

7. Page ES-12, last paragraph: Change "or" to "of" in the next to the last sentence.

Response:

Agree. Text will be changed.

8. Page 1-1, first paragraph: Add "MCAS Cherry Point was placed on the National Priorities List (NPL) in December 1994. The sites included in this report are now managed in accordance with the Comprehensive Environmental Restoration (sic), Compensation, and Liability Act (CERCLA). The Resource Conservation and Recovery Act (RCRA) Section 3008h Administrative Order on Consent is still in effect as an Applicable or Relevant and Appropriate Requirement (ARAR)."

Response:

Agree. Text will be changed, except the word "Restoration" will be replaced with "Response."

9. Page 1-1, second paragraph: Add CTO 211 to the sentence that contains the contract number.

Response:

Agree. Text will be changed.

10. Page 1-2, section 1.2.3, first paragraph: Delete the word "formerly" in the second sentence. The site designations still apply.

Response:

Agree. Text will be changed.

11. Page 1-9, first paragraph: Delete the word "had". Delete "A sludge impoundment area..." Add "A sewer sludge impoundment area..."

Response:

Agree; however, the impoundment was used for industrial sludge, not sewage sludge. Text will be changed to clarify what was disposed in the impoundment. According to the "Evaluation and Recommendations: Unit 10 Former Sludge Impoundment Area" report, the impoundment was "...used to dispose of metal filings, plating sludges, paints, organic solvents, oil and grease, and miscellaneous chemicals..."

12. Page 1-9, second paragraph: Clarify the second sentence, it is awkward.

Response:

The sentence was copied from the site description contained in the Site Management Plan (June 1995). The sentence in question will be deleted because it does not add significant information to the site description provided in the paragraph.

- 13. Page 1-9, third paragraph: Is it true that "Final approval of the Closure plan (sic) is pending?"**

Response:

The sentence was copied from the site description contained in the Site Management Plan (June 1995). According to Renee Henderson, it is a true statement.

- 14. Page 1-12, second paragraph: Change the date in the last sentence from "1994b" to "1994."**

Response:

Do not agree. The item in question (Halliburton NUS, 1994b) is contained in a reference for the Phase II TDM for Units 10 and 16. The reference "(Halliburton NUS, 1994a)" was used to reference the Work Plan for the 1994 field activities at various operable units at the Air Station. The "a" and "b" designations are needed to distinguish these different documents.

- 15. Page 1-12, third paragraph: Delete the first two sentences and insert: "MCAS Cherry Point was placed in the National Priorities List (NPL) in December 1994.. The sites included in this report are now managed in accordance with the Comprehensive Environmental Restoration (sic), Compensation, and Liability Act (CERCLA). The Resource Conservation and Recovery Act (RCRA) Section 3008h Administrative Order on Consent is still in effect as an Applicable or Relevant and Appropriate Requirement (ARAR)."**

Response:

Agree. Text will be changed, except that the word "Restoration" will be replaced with "Response."

- 16. Page 1-12, final paragraph: Delete "Based on a meeting with representatives of U.S. EPA and the State of North Carolina, it was determined..." Add "It was determined..." Change from "Surface soil samples were collected from 11 locations identified by the U.S. EPA and the State of North Carolina Representatives." Change to "Surface soil samples were collected from 11 locations."**

Response:

Agree. Text will be changed.

- 17. Page 2-24, section 2.6.2.3: "Geoprobe" is identified as a percussion equipment. Isn't it actually a hydraulic press that advances the rod? If so, please correct.**

Response:

Agree. The word "percussion" will be replaced with "hydraulic."

- 18. Page 2-27, section 2.6.3.2: Change the fourth sentence to read "The locations were chosen by Air Station personnel to be representative of areas where no releases contamination (sic) took place."**

Response:

Do not agree. The subject sentence from the draft RI Report was an incorrect statement. The locations were not determined by Air Station personnel, as indicated in the draft RI Report. The samples were collected from monitoring well borings at locations that were upgradient of the various OUs being investigated. The text will be corrected.

- 19. Page 2-27, section 2.6.3.2: Use the word processor to perform a search for the words "Back pocket" used to describe the locations of the plates and change to read "Volume 5."**

Response:

Agree. This change will be made throughout the report.

- 20. Page 2-27, section 2.6.4: In the first sentence, replace "1994a" with "1994."**

Response:

Do not agree. The item in question (Halliburton NUS, 1994a) is contained in a reference for the Work Plan for the 1994 field activities at various operable units at the Air Station. The reference "(Halliburton NUS, 1994b)" was used to reference the Phase II TDM for Units 10 and 16. The "a" and "b" designations are needed to distinguish these different documents.

- 21. Page 2-38, last paragraph: The additional sampling was not required by the USEPA and the State of North Carolina. The additional sampling was conducted because we decided as a team that we had data gaps that needed to be filled for the RI. Reword this and stop describing team decisions as being requirements being imposed by EPA and NC. Check the rest of the document for this repetitive error and make the appropriate changes.**

Response:

Agree. The text will be changed as appropriate throughout the report.

- 22. Page 2-39, third paragraph: The sampling locations were not "determined by EPA and NC." Eliminate this type of language here and where it appears in this report.**

Response:

Agree. The text will be changed as appropriate throughout the report.

- 23. Page 3-1, second paragraph: Change "OU-2" to "OU2" in the last sentence to agree with the abbreviation used throughout the text.**

Response:

Agree. Text will be changed.

- 24. Page 3-4, Note 2: Cite USGS report and change from "Units may not be continuous" to "units are not continuous."**

Response:

Agree. Text will be changed and USGS report on delineation of paleochannels and missing confining units will be cited.

- 25. Page 3-26, last paragraph: Mention the on going concerns about dinoflagellates (sp?) in the Neuse River and NC commissions working on the larger regional issues.**

Response:

This was discussed during the December 13, 1995 Partnering Team teleconference on responses to comments on the draft RI Report. The team consensus was to delete all references to fish lesions in future versions of the RI Report.

- 26. Page 4-11, second paragraph: Change the word "staged" to "phased" in the second sentence.**

Response:

Agree. Text will be changed.

- 27. Figure 6-1: Add HI and ICR to the key.**

Response:

Agree. Figure will be changed

- 28. Page 6-72: Include a final Section 6-6 that summarizes the findings of the Risk Assessment.**

Response:

Agree. A summary of the human health risk assessment will be included in a new Section 6.6.

- 29. Section 7: Where are the lesions found on the fish discussed on page 3-26 covered in Section 7?**

Response:

See response to Gary McSmith Comment 25.

- 30. Page 8-6, paragraph 2: The sentence "However, the potential occurrence of adverse ecological effects may warrant further study to determine whether there is a need for remedial actions for soil." is not acceptable in the Final version of this document. If further study is required it needs to be addressed before the RI is finalized. We are not going to keep studying this site. Do we need more information or not? This conflicts with the first sentence in paragraph 4.**

Response:

Agree. Section 8.0 (Summary and Conclusions) for the Final RI Report for OU3 at MCAS Cherry Point contained the following with respect to the ecological assessment: "Although there is a great deal of uncertainty in the ecological assessment, the results appear to indicate that terrestrial fauna may be at some long-term risk as a result of the presence on non-biodegradable contaminants." A statement like this will replace the language used in the OU2 RI Report. In addition, EPA comments on the ecological risk assessment are needed to determine if additional data and information are required. This item was also discussed during the December 13, 1995 Partnering Team teleconference. The Executive Summary and Conclusions sections of the RI Report will be submitted for review by Gary McSmith and Renee Henderson before inclusion in the next version of the RI Report.

91.

**General Comment: The Site Management Plan, page 2-5, dated June 995 (sic) indicates the Vehicle Maintenance Area (Hobby Shop) is part of Operable Unit 2. Why isn't it included in this RI Report?**

Response:

The Hobby Shop (Site 76) will be added to descriptions, drawings, and other text sections, as appropriate.

## COMMENTS FROM RENEE HENDERSON, MCAS CHERRY POINT

### General Comments:

- 1.** Prepare a table of acronyms.

Response:

Agree. A table of acronyms and abbreviations will be added.

- 2.** Prepare a table listing analytes for Priority Pollutants, TCL/TAL, RCRA Target Compound List...

Response:

Agree. Tables listing the analytical programs, except for priority pollutant metals, are included in Appendix G. A list of priority pollutant metals will be added to Table G-2 in Appendix G.

### Specific Comments:

- 1.** Page 1-2, last para: Change "...contain the same types of contamination derived..." to "...contain the same types of suggested contamination derived..."

Response:

Agree. Text will be changed.

- 2.** Page 1-9: Add "Hobby Shop (Site 76)" to the description.

Response:

Agree. This site will be added to descriptions, figures, and other text sections, as appropriate throughout the report.

- 3.** Page 1-9, first para: Note that the sludge impoundment area is included as a hazardous waste management unit in the Air Station's Part B Permit. Identify the "sludge impoundment area" as the "former sludge impoundments".

Response:

Agree. Text will be changed. Also see response to Gary McSmith Comment 11.

- 4.** Page 1-10, last para: What is the location of well B-103? Was this well sampled or used for the investigation or decision on OU2 RI?

Response:

The location of Well B-103 is shown on Plate 2; however, it is missing from other plates (and figures). In addition, during the 1994 sampling round, Well B-103 was sampled, but the sample was inadvertently labeled as Well 10GW45 possibly because of the close proximity of these two monitoring wells. As a result, some of the plates and figures identify Well B-103 as Well 10GW45. These errors will be corrected on the appropriate plates and figures. In

addition, the text will be revised accordingly.

- 5.** Page 1-12, third para: Change "...operable units from the multitude of individual sites..." to "...operable units from the numerous individual sites..."

Response:

Agree. Also see response to Gary McSmith Comment 15.

- 6.** Page 2-5, third para: Which of the aquifer pump test (sic) were not evaluated, and why not?

Response:

Aquifer slug and/or pump tests were conducted on a limited number of wells during the RIIR, but the results were not presented in the RIIR Report. These results were not included in the Draft RI Report because the document that contained the results could not be located. The document was titled "Report on Hydrogeology, Contaminants Detected and Corrective Action/Recommendations for the Former Surface Impoundments" prepared by NUS Corporation in January 1987. This report has now been located, and the results will be incorporated into the RI Report.

- 7.** Page 2-8, Table 2-1: Wells 10GW33, 10GW34, and 10GW35 were installed by EnSafe, Inc. Wells 10EGW05, 10EGW06, 10EGW07, and 10EGW08 were installed by USGS.

Response:

Table 2-1 will be revised to reflect these changes.

- 8.** Page 2-13, third para: What does the subscript (6) denote on BOD?

Response:

The subscript is a (5) and denotes 5-day BOD. The text will be revised to reflect this.

- 9.** Page 2-25, third para: Were the geophysical logs run continuously? Please clarify.

Response:

The geophysical logs were run continuously from near the ground surface to near the bottom of the borehole. The text will be revised to reflect this.

- 10.** Page 2-26, fourth para: How does the description of sandstone apply to unconsolidated sediments?

Response:

The description of sandstone does not apply to unconsolidated sediments. The sentence in question is meant to be a general description of the interpretation of results. This exact discussion is exactly as appears in the OU3 RI Report. The text will be reviewed to determine whether any interpretation was made with respect to unconsolidated materials.



- 11.** Page 2-46, first para: Correct "...TOC and TOX were analyses were performed..." to "TOC and TOX analyses were performed..."

Response:

Agree. Text will be changed.

- 12.** Page 2-46, third para: Clarify that the other 80% was or was not validated by someone else.

Response:

Only 20 percent of the data for the 21 Unit RFI Report was validated, at the request of the Navy. The remaining 80 percent was not validated, except for a cursory evaluation of blank contamination (acetone, methylene chloride) during the data evaluation task. This statement will be added to the text.

- 13.** Page 3-9, Fig. 3-4: Delete the sandstone notation on the legend.

Response:

Agree. Figure will be changed.

- 14.** Page 3-17: Figure number is missing. The 9.00 dashed contour line in the south side should be explained. The groundwater mounding at 10GW40 should also be explained, if possible. As there is no data point to the south of 10GW40, indicating that groundwater flows south, southeast from the mound, the depiction is speculation.

Response:

The figure number (Figure 3-5) is provided in the lower right hand corner; however, it is difficult to read because of the requirement to show information on in-text figures as well as oversize drawings (plates).

The 9.00 dashed contour line was inferred because of the known broad topographic high in this area relative to surrounding data points 10GW32 and 10GW38. An explanation of the dashed line (inferred) will be added to the legend.

The depiction of groundwater flow directions around 10GW40 was developed using the triangulation method of data points at 10GW40, 10EGW1, and S4W2. In addition, there is a subtle broad topographic high in the area of 10GW40. However, the depiction of southerly flow from the mounded area is somewhat speculative. Figure 3-5 and Plate 6 will be revised by deleting contour lines south of an imaginary line formed by connecting wells S4W2, 10GW40, and 10EGW1. In addition, the arrow showing groundwater flow to the south-southeast of 10GW40 will also be deleted.

- 15.** Page 3-26, last para: Provide explanation of lesions if an explanation is available.

Response:

This statement was taken from the Fleming and Hightower report titled "A Biological Evaluation

of Metal Contamination in Slocum Creek, North Carolina" that is provided in Appendix K.3. A review of this report did not contain an explanation of why there were lesions on all fish from Slocum, Hancock, and Goose Creeks, only that they were present. This was discussed during the December 13, 1995 Partnering Team teleconference. The team consensus was to delete all references to fish lesions. Also see response to Gary McSmith Comment 25.

- 16.** Page 4-52, third para: Correct "...there are several wells not so illustrated that show..." to "...there are several wells that show..."

Response:

Agree. Text will be changed.

- 17.** Page 4-67: Well 10EGW08 is identified as a lower surficial well in Table 2-1. I believe that the integrity of this well should be questioned, we have had problems with Yorktown aquifers (sic) constructed by the USGS. Please contact Charles Daniels at USGS and discuss construction and findings with him. Compare contaminants identified in 10EGW08 with contaminants found in other Yorktown wells (especially downgradient of the former sludge impoundments), looks like cross contamination to me. Remember BEHP was a common potable water contaminant and is a historical USGS well construction contaminant. Has the well depth of 10EGW08 ever been confirmed?

Response:

Upon further review of the data and discussions with B&R Environmental field personnel and geologists familiar with MCAS Cherry Point, Table 2-1 is correct. Well 10EGW08 is not a Yorktown aquifer well. The text, tables, and drawings will be revised throughout the RI Report, as appropriate, to correct this error. According to field measurements made by our geologist, this well is approximately 40 feet deep. The rest of the comment no longer applies because 10EGW08 is not a Yorktown aquifer well.

- 18.** Page 4-72, fifth para: Correct the "...Vehicle Maintenance Compound..." to "the Hobby Shop (Site 76)..."

Response:

This change will be made throughout the document, as appropriate.

- 19.** Page 4-74, first para: Does the summary table list all "detects"? If not, please correct.

Response:

Table 4-14 contains all contaminants detected in Turkey Gut surface water for all sampling events.

- 20.** Page 4-74, third para: Are the AWQC exceedances in a table? If not, please provide.

Response:

Federal AWQC for the protection of human health and maximum surface water exposure

concentrations are provided in Table 6-11 for the Baseline Human Health Risk Assessment. Also see response to Linda Raynor Specific Comments 35 and 36.

- 21. Page 4-79, third para: Does anyone know where (from what rock or mineral deposit) antimony comes from?**

Response:

The following discussion was found in the CRC "Handbook of Chemistry and Physics:" "It is not abundant, but is found in over 100 mineral species. It is found native, but more frequently as the sulfide, stibnite ( $\text{Sb}_2\text{S}_3$ ); it is also found as antimonides of the heavy metals, and as oxides". This is the most complete source found based on a cursory review of several chemistry textbooks and handbooks.

- 22. Page 4-81, second para: Why is the 75 ug/kg value used?**

Response:

The 75  $\mu\text{g/kg}$  value was used simply to provide an indication of the dichotomy in the results. This was the highest value, except for detections of 2-butanone and di-n-butylphthalate. Any other random number could have been used, except a comparison to the results for the other compounds was desired. The text will be revised to clarify this point.

- 23. Page 4-81, fourth para: What were the pesticide concentrations and what were the downgradient concentrations? Clarify the point.**

Response:

The pesticides detected in Turkey Gut in 1994 and their concentrations are as follows, as indicated in Table 4-17: alpha-chlordane (25  $\mu\text{g/kg}$ ); gamma-chlordane (8.8  $\mu\text{g/kg}$ ); 4,4'-DDD (3.4  $\mu\text{g/kg}$ ); 4,4'-DDE (1.4  $\mu\text{g/kg}$ ); 4,4'-DDT (0.2  $\mu\text{g/kg}$ ); dieldrin (22  $\mu\text{g/kg}$ ); endosulfan II (0.24  $\mu\text{g/kg}$ ); endrin aldehyde (0.40  $\mu\text{g/kg}$ ); endrin ketone (1.2  $\mu\text{g/kg}$ ); heptachlor (0.15  $\mu\text{g/kg}$ ); and heptachlor epoxide (16  $\mu\text{g/kg}$ ). The upstream sample for Turkey Gut was collected at location OU2SD5. All other locations are downstream of this point. The text will be revised to clarify this point.

- 24. Page 4-90, first para: The discussion on leachate seep sediment samples is confusing, what point is trying to be made?**

Response:

The text will be changed by adding a sentence that concludes that the leachate seep sediment chemical analytical results indicate that there is little difference between the leachate seep sediments and the natural surface soil. This is the point that was trying to be made and the reason for combining the leachate seep sediment and surface soil results for exposure and risk assessment purposes.

- 25. Page 4-102, second para: Explain which scenarios are/where (sic) used for the 0 to 10 feet risk assessment.**

Response:

Since the exposure scenarios and receptors are not mentioned until Section 6, it may be better to mention only that the 0- to 10-foot samples are used for scenarios involving soil disturbance rather than being more specific. The text will be revised in this manner. It should be noted that these samples are used for the construction worker only (page 6-16).

- 26.** Page 4-102, fifth para: The sample number for the "only one subsurface soils (sic)" sample should be identified.

Response:

The sample number (10B03-0810) is provided in the second sentence of this paragraph.

- 27.** Page 4-109, third para: We should really evaluate the well integrity of 10EGW08.

Response:

This text, and in other sections, will be revised, since 10EGW08 was mistakenly identified as a Yorktown aquifer well. Since this well monitors the surficial aquifer, there is no need to evaluate well integrity.

- 28.** Page 6-53, Table 6-11: Provide a key for "---". Can exceedances be highlighted/shaded...?

Response:

The "---" means that the chemical was not detected in a particular medium. This will be added as a footnote. Groundwater and surface water maximum exposure concentrations that exceed any of the appropriate standards will be shaded and/or highlighted.

- 29.** Page 7-3, Figure 7-1: Provide a key for all symbols, the key for the old field (?) is incorrect or missing.

Response:

The key for the "old field" is rotated 90 degrees in the legend. This figure and Plate 15 will be changed so that the orientation of the legend and symbols are correct.

- 30.** Page 7-11, fifth para: The location of the ditch should be identified.

Response:

The "ditch" referred to in the text is Turkey Gut. The text will be changed to reflect this.

- 31.** Page 8-2, second para: Correct the spelling of "...resuts..." to "...results..."

Response:

Agree. Text will be changed.

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Page 8-3, first para: Raising the question of an "outside source" is inappropriate based on the information we have. Again, talk with the USGS folks who installed these wells to identify well construction materials and construction practices.

Response:

Agree. The sentence in question will be deleted. The sentence mostly dealt with contaminants found in 10EGW08, which was mistakenly identified as a Yorktown aquifer well. This text, and other sections of the report, will be revised accordingly to indicate that 10EGW08 is installed in the surficial aquifer.

## COMMENTS FROM GENA TOWNSEND, USEPA, REGION IV

The conclusion section of this document (section 8.2) is written in the same style as Operable Unit 3. This area was discussed in great detail during the review of comment meeting for OU3 and it was understood that the OU2 document would contain the corrections.

Phrases such as "would typically", "might consider to be" ... should be removed. The Remedial Investigation Report is designed to present the facts of the sites, (contaminated areas, exceedances of standards, etc...) and identify the need for remedial actions. Sentences such as "Remedial action may be warranted" are inconclusive. When will it be decided if the action is warranted? The purpose of the RI is to answer these type of questions.

The section also states that "No data gaps have been identified for this site. The data for this site are adequate to both define and select a remedial alternative". If this is a valid statement, they why did the text not identify the need for a remedial action. This section should be rewritten.

Response:

The review of comment meeting (teleconference) for the OU3 Draft RI Report was conducted on September 26, 1995. The contractual date for delivery of the Draft RI Report for OU2 was September 28, 1995. There was insufficient time to include this in the OU2 RI Report considering the amount of time (i.e., days) needed to produce a document as large as this. This section will be rewritten using the style of the RI Report for OU3.

### 1.0 General Comments

1. The Executive Summary, Pages ES-6 through ES-12, in the Nature and Extent of Contamination subsection, shows concentrations of detected contaminants in the medias (sic). However, except for a few contaminants, the text does not indicate whether the concentrations of those contaminants are a maximum or a range. Without a clear definition of the concentrations, the data presented in this subsection is unclear. The text should be clarified and revised accordingly.

Response:

Disagree that section needs rewritten. Total ranges were not provided, because in most cases, the range would be from not detectable to the maximum concentration. If a single value is provided, it is a maximum. If a range is given, it is the range of positive detections. An Executive Summary is a summary of the overall nature and extent of contamination. Details on the nature and extent of contamination are provided in Section 4, and all analytical data are provided in Appendix H.

2. Section 1.2.2, on Page 1-2, Paragraph 2, describes the three sites of Operable Unit 2 (OU2) that are analyzed in this Remedial Investigation (RI). However, Figure 1-3, a general site location map, shows an additional area of abandoned drummed petroleum. The historical and present day significance of this area should be included in this report, in order to characterize the site.

Response:

Section 1.2.2 is titled Air Station History; the comment is in reference to Section 1.2.3.

Available information on this area will be added.

3. Figure 1-3, Page 1-7 (Plate 1), identifies the four landfills. However, the figure does not clearly identify Site 10. According to RCRA, each SWMU should be identified as a separate site. The text should be revised accordingly.

Response:

The fence to the north, east, and south of the fill areas and Slocum Creek form the boundary of Site 10. Figure 1-3 and Plate 1 will be revised to identify Site 10.

4. Section 2.1.2, Page 2-11, Paragraph 2, states that groundwater was sampled in accordance with the EPA SOPQAM. However, temperature, one of the parameters, was not checked prior to collecting the lab samples. Section 4.9.7 of the EPA SOPQAM states that pH, specific conductance, and temperature be measured each time a well is sampled.

Response:

According to the groundwater sample log sheets included in Appendix C.1, temperature was recorded for the majority of the wells sampled during the RIIR and in subsequent B&R Environmental investigations. The RI Report states "...analyses consisted of the groundwater contaminant indicator parameters..." Temperature was not considered to be an indication of groundwater contamination. Therefore, temperature was not included in the subject text.

5. Section 2.2.4 and 2.4.3 state the location and the number of surface water/sediment samples and test pit excavations. However, the text does not provide the rationale for these sample locations and test pit excavations. The text should explain the rationale for all sampling.

Response:

Agree. Section 2.2.4 will be revised to indicate that samples were taken along the length of Turkey Gut and from Slocum Creek upstream and downstream of the mouth of Turkey Gut.

Section 2.4.3 will be revised to indicate that test pit locations were based on the magnetometer survey and a review of past aerial photographs of the area.

6. Section 2.4.2 states that biased boring locations, BB1 through BB12, were chosen to establish coverage throughout the southern portion of Site 10. However, the text does not state if evidence of contamination existed. According to the EPA SOPQAM, certain conditions, such as stains or vegetation stress, must exist in order to justify sampling (EPA, 1991). Also some of these borings (BB2, BB11, BB12) are located in the central, not the southern section of the site. The text should be revised accordingly.

Response:

The text will be revised to indicate that the biased borings were installed in the southern and central sections of the site and that some locations were based on a review of past aerial photographs of the area. The fact that the biased borings were installed within a known landfill area would seem to be sufficient evidence to justify sampling of subsurface materials. No surface soil samples were collected from the biased borings.

7. Section 2.6.3.2. describes background soil sampling efforts in order to characterize soils at the MCAS Cherry Point Site (CPS). The text also states that surface water samples were collected upstream of the site in order to collect background surface water samples. However, background groundwater sampling locations are not identified, until Section 4. The analytical results for these wells are presented without describing their locations. An explanation should be provided as to where background groundwater samples were collected in order to evaluate the validity of the groundwater sample analysis.

Response:

Background groundwater sampling was conducted in 1993, during an investigation of 10 units at the Air Station (10 Unit TDM). However, the investigation did not include any of the sites associated with OU2. An additional section will be added that will include the background sampling effort.

8. Section 3.3 describes the surface water hydrology of Operable Unit 2. However, the text does not include the following information regarding the surface water on-site: flow rate, stream width, physical dimensions, and flooding potential. According to EPA guidance, the text should address this information in order to determine transport times, dilution potential, and potential spread of contamination, for the given surface body (EPA, 1988).

Response:

This information was not found in any of the reports that described investigations prior to 1994, and the information was not recorded during the 1994 or 1995 sampling events. Stream dimensions and flooding potential will be determined from site maps and floodplain information. It may not be possible to determine flow rates, especially since Slocum Creek is tidal. The information will be added to the text.

9. Table 4-5, Pages 4-39 through 4-46, summarizes the groundwater sampling program at OU2. However, the table shows many blank spaces for parameters. Without a footnote to define the blanks, it is unclear whether the contaminants were not analyzed or not detected in the groundwater samples. The table should contain footnotes to explain the absence of parameters.

Response:

A footnote will be added to this table (and other tables that summarize sampling programs for other media) to describe the "X's" rather than the blank spaces. The "X" designates the analytical parameters analyzed for each sample.

Footnotes to explain the absence of parameters will not be added to this table. As provided in Section 1.2.4, Page 1-10, past work was conducted using a phased approach that was based on the availability of funding and the prioritization of sites in terms of potential environmental impacts. The work was conducted under several environmental programs according to regulatory requirements in effect at the time. For these reasons, many of the samples collected prior to 1994 were not analyzed for the full suite of organic and inorganic analytes. Adding footnotes to explain this for each field sampling event would make this table confusing. The intent of the table is simply to show the parameters analyzed for each sample collected at OU2.



10. Figure 2-1 (Plate 2), Page 2-3, shows the sample and cross section locations at Operable Unit 2. However, study areas are outlined on the map without an explanation of their significance. In addition, the figure does not show a north arrow. Finally, the figure presents too much information on one sheet. In order to clarify the information presented the text should provide different maps for different years, north arrows, and explanations of the study areas.

Response:

A north arrow will be added to this figure and plate, and an explanation of the study areas will be added to the legends. One of the purposes of this figure (and plate) is to show the large number of sampling locations at OU2. The figures (and plates) provided in Section 4 that show areas of soil and groundwater contamination show less information. Therefore, separate maps for different years will not be provided, partly because of the high level of effort that would be needed to generate these maps.

11. Section 4.7, Pages 4-95 through 4-119, presents a summary which contains an overview of the chemical analytical data for various media at OU2. However, the text does not present a summary for polishing pond sediment which was discussed in Section 4.6. Also, the text does not provide an explanation for the missing summary or for not addressing pH data of the groundwater. Thus the text should present the summary for the polishing pond sediment and address the pH of the water media.

Response:

A summary for polishing pond sediment will be added to Section 4.7. Field pH measurements are provided on the sample log sheets in Appendix C. The pH range will be added to the groundwater and surface water summary tables in Section 4.7.

12. Section 4.7.2, Pages 4-102 through 4-105, presents a summary of subsurface soil from 0 to 10 feet. However, the text's definition of subsurface soil is misleading. According to the EPA SOPQAM, subsurface soil extends from approximately 12 inches below ground surface to a site-specific depth (EPA, 1991). Because the text misinterprets subsurface soil, some of the results presented in this section (See Table 4-26) also appear in the surface soil data of Table 4-25. For example, the concentrations of many semivolatile organics are the same on both tables. This indicates that some of the surface soil (0 to 2 feet) data have been misused and presented as subsurface soil data. The text should exclude all discussion of 0 to 2 feet data from the subsurface soil section.

Response:

The intent of this summary section is to "set the stage" for the risk assessment in Section 6. Soil results from 0 to 2 feet and from 0 to 10 feet are both used for risk assessment purposes along with results for dry leachate seep soil. Analytical results from samples collected deeper than 10 feet are not used for human health risk assessment purposes. The heading for Section 4.7.2 will be changed to "Surface Soil, Subsurface Soil, and Dry Leachate Seep Soil (0 to 10 Feet)." This change will also be made throughout Section 4.7 as appropriate. In addition, an explanation of why the 0- to 10-foot range is used will be added to the text.

13. Figures 4-1 through 4-5 show positive detections of constituents of concern at OU2. However, the figures are unclear, making it difficult to see the migration of the plume.

Isoconcentration maps contouring the horizontal distribution of contaminants should be included for clarity. These maps should be developed for each medium: soil, groundwater, and surface water/sediment.

Response:

The groundwater data are such that it would not be possible to prepare isoconcentration maps, and it is only possible to show general areas of contamination. This was discussed in the OU2 data presentation meeting on May 2, 1995. The analytical results for soil also show only "hot spots," and it would not be possible to draw meaningful isoconcentration data. The analytical data for surface water and sediment are such that a meaningful isoconcentration presentation could not be made. As discussed during the December 13, 1995 Partnering Team teleconference, additional descriptions of soil "hot spots" and their relation to the water table will be added.

14. Section 8, Page 8-1, draws various conclusions from the RI data in the human health and ecological risk assessment. However, the text lacks reference to tables, figures, reference points, or comparisons to support the conclusions. The text should incorporate tables and figures into the conclusion summaries to support the results of the investigation and conclusions drawn from the report.

Response:

Tables and figures that would be added to Section 8 would be identical to tables and figures used in other sections of the report. However, references to the appropriate sections, tables, figures, etc., will be added to Section 8.

15. Section 8.1.1, Page 8-3, Paragraph 1, Sentences 2 and 4, states "The organic contaminant detected in the most recent sampling event (1994) include chloroform, methylene chloride, and bis (2-ethylhexyl)phthalate, which are all common laboratory contaminants... Therefore, an outside source of contamination may be possible from some or all of the sample results." However, the text does not present laboratory blank concentrations of those detected contaminants in any section. Without showing the blank concentrations of laboratory contaminants, it may be inappropriate to conclude that the cause of contamination may come from outside. The text should address the blank concentrations of laboratory contaminants based on the EPA guidance in related sections of this document.

Response:

Agree. The text will be rewritten to state the facts, with no inference or speculation.

16. Section 8.1.1, Page 8-3, Paragraph 2, Sentence 3. states that the concentrations of some metals in leachate seep water exceeded the concentrations of those metals in the surficial aquifer, while other metals did not. However, the text does not discuss the significance of higher concentrations of metals in leachate water versus those in the surficial aquifer. If the metal contaminants in leachate seep water can affect the surficial aquifer, the metal contamination, in addition to volatile organics, may also be a major concern (page 8-2, paragraph 2). The text should present a discussion on the significance of metals in leachate seep water.

## Response:

The metals detected at higher concentrations in leachate seeps include cadmium, chromium, copper, lead, nickel, selenium, thallium, and zinc. Of these metals, only cadmium ( $6 \mu\text{g/L}$ ) and lead ( $24.1 \mu\text{g/L}$ ) exceeded the state groundwater standards ( $5 \mu\text{g/L}$  and  $15 \mu\text{g/L}$ , respectively). These concentrations were detected in OU2LW01. The low flow rate of this seep makes it unlikely that the leachate water would migrate to groundwater and cause an exceedance of a groundwater standard. In addition, this leachate seep may be an area of groundwater discharge. This will be added to the text.

17. **Section 8.1.2, Page 8-4, Paragraph 1, Sentence 9, states that manganese, which was a prevalent groundwater contaminant, was also found in Turkey Gut (surface water) at concentrations that exceeded drinking water and groundwater standards. However, it is inappropriate to compare the contaminant in the surface water with the drinking water and groundwater standards. The text would be revised accordingly.**

## Response:

This comparison was made because groundwater from the surficial aquifer is known to discharge to Turkey Gut. In addition, the state has no freshwater water quality standard for manganese. The EPA water quality criteria for water and fish ingestion is the same as the drinking water standard. The text will be revised to reflect this.

## 2.0 Specific Comments

1. **Table of Contents, Pages ii through x: The text does not present a List of Acronyms following the contents page. The text should be revised to include a List of Acronyms for review.**

## Response:

Agree. A list of acronyms (and abbreviations) will be added following the contents.

2. **Section 1.2.2, Page 1-2, Paragraph 1, Sentence 1: The text contains a typographical error. Material is misspelled as "materiel." The misspelling should be corrected.**

## Response:

Disagree. The term "materiel" is correct. It is a military term for equipment and supplies.

3. **Figure 1-3, Page 1-7: Figure 1-3 is the general site location map that shows Site 44A and Site 46. However, Site 10 is not identified on this map. In addition, the map does not have a north arrow and reference. The map should indicate the north direction and identify Site 10 on the map.**

## Response:

Agree. A north arrow and the Site 10 boundary will be added to this figure and corresponding Plate 1.

4. **Section 1.2.3, Page 1-9, Paragraph 3: The text indicates that Site 46 will not be used as**

aeration ponds and that a Closure Plan for Site 46, submitted in December 1988, is pending final approval. However, the text does not indicate whether Site 46 is still active or not. The text should be clarified.

Response:

Agree. The text will be changed to reflect that these ponds are inactive.

5. **Figure 2-1 (Plate 2), Page 2-39:** This figure uses the same symbol for magnetometer data point and staff gauge. However, the legend should use different symbols to distinguish what they represent. Also, the Plate and the Figure should show north arrows. The text should be revised accordingly.

Response:

Figure 2-1 is on page 2-3. A north arrow will be added to both Figure 2-1 and Plate 2. The symbols for magnetometer data point and staff gauges is a circle; however, staff gauges have an "SG" designation followed by a number and magnetometer data points have a letter (A through F) followed by a number. In addition, staff gauges are all located along water bodies, whereas magnetometer data points are not. The symbols will not be changed on Figure 2-1 or Plate 2.

6. **Section 2.6.5, Page 2-32:** The text discusses sampling locations on Plate 2 and Figure 2-1. However, the sample names identified in the text (OU2SW/SD1) do not match the sample names on the map (102SW/SD1) (sic). The text and legend for sample identification should be consistent.

Response:

The confusion arises because samples collected from 1994 and 1995 have an "OU2" designation, which is not reflected on the figure and plate, and prior samples have the site designation, such as "10" or "44A." The "OU2" designation will be added to all 1994 and 1995 data points.

7. **Section 2.6.6, Page 2-33, Paragraph 1:** Section 2.6.6 discusses the steps taken for equipment decontamination, including a nitric acid rinse diluted with deionized water (for metal samples). However, according to the EPA guidance, cleaning procedures for stainless steel sampling equipment do not include a nitric acid rinse (EPA, 1991). The correct decontamination procedures include:

- 1)Wash equipment with lab detergent and hot water.
- 2)Rinse with tap water.
- 3)Rinse with deionized water.
- 4)Rinse twice with solvent and allow to air dry.
- 5)Wrap in aluminum foil.

An explanation should be included in the text regarding why EPA SOPQAM decontamination procedures were not followed.

Response:

The reviewer is correct. However, there is no explanation why a nitric acid rinse was used,

but its use was identified in the Work Plan. This deviation from EPA protocols is not suspected of adversely affecting the sampling results.

8. **Section 3.6.2, Page 3-23, Paragraph 1, Sentence 3:** The text states that the hydraulic conductivity for the Pungo River Confining Unit was measured as 6.6 E-07. However, the text gives no unit of measure for this hydraulic conductivity value. The units of this hydraulic conductivity measurement should be added to the text.

Response:

Agree. The units of "cm/sec" will be added to the conductivity value.

9. **Table 4-4, Pages 4-19 through 4-21:** Table 4-4 shows soil analytical results greater than 2 feet. Since the soil samples were taken from 2 to 26 feet, the text should indicate that they are subsurface soil analytical results.

Response:

Agree. The table will be changed.

10. **Figures 4-1 and 4-2, Pages 4-23 through 4-27:** Figures 4-1 and 4-2 show a symbol with a half-shaded circle, but it is not included on the legends of both figures. This symbol should be included and defined in the legends of both figures.

Response:

Agree. This symbol indicates a surface soil sample. The symbol will be added to the legends of Figures 4-1 and 4-2 and the corresponding Plates 8 and 9.

11. **Table 4-7, Pages 4-49 through 4-51:** Table 4-7 shows blank spaces in the column for North Carolina standards for analytes. However, the column entries should contain "NR" (Not Regulated), if the blanks indicate that the analytes are not regulated by the state.

Response:

Agree. Table 4-7 will be revised as appropriate and a footnote will be added. Also see response to Linda Raynor Specific Comment 32.

12. **Table 4-8, Page 4-53:** Table 4-8 shows concentration trends in selected surficial aquifer wells at OU2. However, the table does not indicate whether the concentrations are maximum or average concentrations. In addition, the table does not show concentration units. The text should provide an explanation about the concentrations and add concentration units.

Response:

The concentrations are neither maximum nor average concentrations. They are the concentration that was measured at a particular well during the corresponding sampling event. For example, during the 1994 sampling event, trichloroethene was detected at a concentration of 4  $\mu\text{g/L}$  at 10GW12. Concentration units ( $\mu\text{g/L}$ ) will be added to the table.

13. Table 4-9, Pages 4-55 through 4-60: Table 4-9 is entitled "Exceedances of State Groundwater Standards - Surficial Aquifer." However, first, Table 4-9 is really a summary of the groundwater results. The table shows some contaminants exceeded the state standards, some contaminants were below the standards, and some contaminants were not detected or not analyzed. Therefore, the title of the table does not match the contents. Second, Table 4-9 does not show concentration units. The table should be revised to show concentration units and a more accurate title.

Response:

The title will be changed to "Surficial Aquifer Analytical Results - Most Recent Sampling Round," and concentration units will be added.

14. Table 4-16, Page 4-80: Table 4-16 presents a summary of the sediment sampling program at OU2. however, the footnotes do not provide an explanation for the symbols or blank spaces. Therefore, it is unclear whether "x" indicates detection and blanks indicate not detected or not analyzed. The text should be clarified and revised accordingly. This comment also applies to Table 4-19.

Response:

A footnote will be added to this table (and other tables that summarize sampling programs for other media) to describe the "X's" rather than the blank spaces. The "X" designates the analytical parameters analyzed for each sample.

15. Section 4.4, page 4-81, Paragraph 3, Sentence 2: The text states that none of the pesticides listed in Table 4-16 were detected at maximum concentrations exceeding 25  $\mu\text{g/kg}$ . However, the pesticides are not listed in Table 4-16, but in Table 4-17 (see page 4-82). This discrepancy would be corrected.

Response:

Agree. Text will be changed.

16. Tables 4-20 and 4-21, Pages 4-88 and 4-89: Tables 4-20 and 4-21 present summaries of analytical results of leachate seep water and sediment (1985 - 1987), respectively. However, the footnotes of both tables state that some of the samples were collected in 1995. The title of the tables contradicts the footnotes. Therefore, the text should be revised accordingly.

Response:

Agree. The title of the table is correct; the footnote will be corrected by deleting reference to samples collected in 1995.

17. Table 4-100 (sic), Page 4-100: Table 4-25. a summary of analytical results, shows 2,4-Dinitrophenol and 4-Nitrophenol as semivolatile organics that were found in surface soil and dry leachate seep soil. However, these two contaminants are not found in previous tables for summaries of the surface soil (Table 4-3) and the leachate seep soil (Table 4-23). The text provides no explanation for this inconsistency. Thus, the text should be clarified and revised accordingly.

Response:

Agree. Table 4-23 is incorrect; it will be revised to show all analytes that were detected.

18. Table 4-25, Pages 4-100 and 4-101: A footnote on Table 4-25 indicates that 18 samples from the surface soil and dry leachate seep soil at OU2 were analyzed. However, according to the frequency of detection, it appears that less than 18 samples (12, 13, and 16) were analyzed for some of the contaminants shown in the table.

Response.

The footnote and the frequency of detection are correct. A total of 18 samples have been collected, but not all of the samples were analyzed for all of the parameters listed on the table. Sampling conducted prior to 1994 often did not include the full TCL/TAL list of analytes.

19. Section 4.7.7, Page 4-117, Paragraph 5, Sentence 4: The text states that the lack of consistency (concentrations of metals in the groundwater and leachate seeps) is thought to be representative of local soil conditions. However, the text does not present any references regarding the local soil conditions. Thus, the text should present an appropriate reference.

Response:

The sentence is speculative and will be deleted.

## COMMENTS FROM LINDA RAYNOR, NCDEHNR, SUPERFUND SECTION

### General Comments

1.

The more recent (1994-95) RCRA groundwater sampling data needs to be incorporated into the discussions, tables and figures of this report. RCRA data needs (sic) to be compared to the groundwater data collected under the IRP program (hopefully, there will not be any inconsistencies). If inconsistencies do exist, (especially if chemicals have been detected under the RCRA sampling program, and do not appear in the IRP data), the RCRA data should be included in the delineation of groundwater plumes and included in the risk assessments. Are there other sources of sampling data for this operable unit other than the RCRA groundwater monitoring data and the IRP data collected? For example, is the base conducting surface water monitoring, perhaps as a permit requirements, in this area?

NOTE: For each operable unit being investigated under the IRP program, whenever any other sampling (groundwater, surface water, etc.) is being conducted under another program, outside the IRP program, or as a result of permit requirements, those sampling results should be identified, evaluated, discussed, and incorporated, as necessary, into the assessment of contamination and the evaluation of risks at that operable unit.

Response:

This comment was discussed during the December 13, 1995 Partnering Team teleconference. At this point in the project, it is recommended that this large amount of information be included in the RI Report only if it is decided to be absolutely necessary. The draft RI Report already shows a large area of groundwater contamination in the surficial aquifer (basically the entire site) that exceeds state groundwater standards. The report also identifies unacceptable risks from ingestion of shallow groundwater under a future residential use scenario. Inclusion of the RCRA data is not expected to change the overall outcome and conclusions of the RI Report (e.g., groundwater contamination, unacceptable risks). Inclusion of the RCRA data is not a "simply" task and will result in a delay in the submittal of the Final RI Report and will further delay submission of the draft FS/PRAP/ROD. (Data presented in the RI is also summarized in the FS).

During the December 13, 1995 teleconference, it was agreed by the team that available RCRA groundwater monitoring data would be reviewed to determine whether it was consistent with the IRP data. There are no surface water data, except that collected under the IRP program. RCRA groundwater data is limited to wells that monitor the Site 46 polishing ponds and the former sludge impoundment area. A review of recent (1995) RCRA groundwater data indicates that it is consistent with the data collected under the IRP program that is presented in the RI Report. Therefore, the RCRA groundwater data will not be included in the next version of the RI Report for QU2.

2. The areas of soil contamination (lateral and vertical extent) are not easily identified in this report. Although the concentrations and depths of BTEX compounds, chlorinated solvents, copper, lead and zinc are displayed on separate plates, the lateral and vertical extent of contamination by these chemicals is not easily determined. Knowing the vertical extent of contamination in relation to the water table is especially important, therefore, this information needs to be presented somehow in this report. Also, other contaminants exist in high concentrations that are not displayed on any of the figures/plates. For example, ketones exist in Study Area B at 16,000 ug/kg. These other contaminants and areas of soil contamination



also need to be accounted for and identified somehow on a map.

Response:

This was discussed during the December 13, 1995 Partnering Team teleconference. Agree that areas of soil contamination are not easy to identify. This is due to the nature of the analytes detected. There are no horizontal or vertical "patterns" to the contaminants identified. Rather, the elevated detections in soil can be considered to be "hot spots", while the entire landfill area can be considered to be the main "source" of groundwater contamination. It would be difficult to display a "three-dimensional picture" of soil contamination that would also show relation to the water table. However, the depth of the soil samples and the depth to the water table are provided in the report. It is acknowledged that not all elevated detections are shown graphically; however, the locations are identified in the text.

During the teleconference, it was agreed that a discussion of the depth of "hot spot" soil contamination versus the depth to groundwater will be included in the text, as appropriate. In addition, areas of soil contamination that need to be addressed in the Feasibility Study will be identified in the section on Conclusions and Recommendations.

3. Much redundancy exists in the text and tables of this report. Because of repetition, inconsistencies were generated between the different sections of the text, between table, and between text and corresponding tables. Some of these inconsistencies have been noted in the specific comments below. Please try to minimize the redundancy to help eliminate inconsistencies.

Response:

The report will be checked for inconsistencies.

**Specific Comments:**

1. **Page ES-1:**  
- (2nd para.) - "OU2 consists of three sites.." According to the Site Management Plan, the Vehicle Maintenance Area (Hobby Shop) is included in OU2. If so, information needs to be added for this site, and corrections are required throughout the document regarding the number of sites in OU2.  
- (3rd paragraph) - "A sludge impoundment area that was closed in the mid-1980s is also located at Site 10." Need to elaborate somewhat to provide information that this was the area that contained the two industrial sludge pits 1 and 2 which are identified on the RCRA permit.

Response:

The Hobby Shop (Site 76) will be added to the text and figures in the report.

Text will be changed to indicate that the industrial sludge pits are identified on the RCRA permit. Also see responses to Gary McSmith Comment 11 and Renee Henderson Specific Comment 3.

2. **Page ES-3:** typo "pattern."

Response:

Typo will be corrected.

3. **Page ES-9:** (1st para.) - "These areas of concern are were..." Should this be "are where?"

Response:

Agree. Text will be changed.

4. **Page ES-12:** (last para.) - "In general,... concentrations of metals.." Correct bolded ("f" in "of").

Response:

Agree. Text will be changed.

5. **Page ES-14:** (2nd para.) - "Recreational users were assumed to be exposed to surface water and sediment via direct contact." Why would they not also be exposed to surface soils in a future recreational scenario (for example, picnicking)?

Response:

Recreational users were an offsite (local residents) receptor group evaluated under both current and future land use conditions only for surface water and sediment exposures. The name "recreational users" was given to this receptor/exposure scenario combination. We have evaluated one intermittent receptor to surface soil (the adolescent trespasser), as well as future full-time residents and employees. Local residents/recreational users are considered to have a 30-year exposure duration and are not considered to be likely to picnic at this particular site (a landfill). Future land use was considered as residential or industrial worst case options. Adding another intermittent exposure to surface soil will add nothing to the risk assessment as far as bracketing the range of potential risks. That is, the risks for this receptor could be similar to or slightly greater than the risks for the adolescent trespasser but certainly not as great as those for the full-time residents or employees routinely exposed to surface soil.

This exposure scenario will not be added to the RI Report.

6. **Page ES-15:**  
- (1st line) - delete "may."  
- (table at bottom of page) - Why was Turkey Gut not evaluated for cancer risk and hazard index? (This may be a recreational site in a future scenario, therefore, perhaps the adult and child recreational user risks should be calculated.)

Response:

The word "may" will be changed to "many."

The recreational user is defined in Section 6.2 as being exposed to Slocum Creek during fishing, swimming, or boating. The activities do not occur, and would be highly unlikely ever to occur, in Turkey Gut. An adolescent trespasser was evaluated for exposures in Turkey Gut

during wading or play.

Children are defined in the risk assessment as ages 6 or under. These small children are not likely to spend a great deal of time swimming, boating, or fishing in Turkey Gut or any other water body. The adolescents (evaluated over an exposure period of 9 years versus 6 years for adults or children) cover exposures for intermittent use of Turkey Gut.

These exposure scenarios will not be added to the RI Report.

7.

**Page 1-9:**

- (1st para.) - Need to elaborate on last sentence of this paragraph (see specific comment 1 above.)
- (2nd para.) - Awkward sentence: "Regulators have expressed concern..." Please clarify.
- (3rd para.) - Insert information on the depth of the two unlined ponds.

Response:

Text will be changed to indicate that the industrial sludge pits are identified on the RCRA permit. Also see response to Renee Henderson Specific Comment 3.

The sentence was copied from the site description contained in the Site Management Plan (June 1995). This sentence will be deleted. Also see response to Gary McSmith Comment 12.

These ponds are approximately 12 feet deep. Text will be revised to include the pond depth.

8.

**Page 1-10 - (2nd para., last sentence) - Insert units for 2.5.**

Response:

The units (feet) will be added to the text.

9.

**Page 2-1: (1st line) - "There were five field investigations conducted at Operable Unit 2 (formerly...)..." Delete "formerly" (these sites are still included in OU2) and include the Vehicle Maintenance Area.**

Response:

Agree. Text will be changed, and the additional site will be added throughout the document.

10.

**Page 2-5:**

- \*(1st bullet) - "Drilling and installation of 15 monitoring wells" - Discrepancy noted: Table 2-1 lists 14 HNUS wells and 3 USGS wells during this period of 1984 through 1987 (unless date for GW04 is incorrect in the table).
- "Slug tests were also performed at monitoring wells... These data have not been evaluated." Why were these not evaluated.

Response:

The installation date for 10GW04 is incorrect in Table 2-1. The date will be changed from

"42-10-91" to "12-10-84."

Aquifer slug and/or pump tests were conducted on a limited number of wells during the RIIR, but the results were not presented in the RIIR Report. These results were not included in the Draft RI Report because the document that contained the results could not be located. The document was titled "Report on Hydrogeology, Contaminants Detected and Corrective Action/Recommendations for the Former Surface Impoundments" prepared by NUS Corporation in January 1987. This report has now been located, and the results will be incorporated into the RI Report. This was also discussed in response to Renee Henderson Specific Comment 6.

**11. Table 2-1 (and groundwater plates):**

- Wells 10EGW07, 10EGW08 and 10GW16 - the monitored aquifer indicated for these wells is the surficial aquifer, however, these wells are located on the Yorktown Aquifer Plate 14. Are these upper Yorktown wells?
- Wells 10GW22, 10GW23 and 10GW24 - these are labeled as "10EGW\_" wells on Plate 14.
- Well OU2MW10, the top or riser elevation does not coincide with the information in Table 2-4.
- Include information on the hydropunch/temporary monitoring wells.
- Wells S2W1, S1W6 and S1W6A are not located on the Yorktown Aquifer Plate 14.

Response:

Wells 10EGW07, 10EGW08, and 10GW16 are lower surficial wells. Plate 14 and other applicable plates and figures will be revised.

The "E" designation will be removed from wells 10GW22, 10GW23, and 10GW24 on Plate 14 and other figures and plates, as appropriate.

According to the Monitoring Well Construction Sheet for well OU2MW10, the top riser elevation is 18.17 feet. The elevation is correct on Table 2-1 and incorrect on Table 2-4. Table 2-4 will be revised to include the correct top of riser elevation. The water level information provided is correct.

The table will be revised to add the Hydropunch information, except for Top of Riser Elevation, Total Well Depth, and Monitored Interval, which is not available or not applicable.

Wells S2W1, S1W6, and S1W6A were never sampled by B&R Environmental, and no other analytical results were located for these wells. Plate 14 was intended to show the results for Yorktown aquifer wells. If the wells were included, it would not be possible to tell whether the wells were or were not sampled.

**12. Page 2-11:**

- (1st para., Section 2.1.1) Include information on the installation of 1987/1988 wells.
- (3rd para.) "The first round...selected toxic metals (arsenic, cadmium...)..." Table 4-5 (footnote 2) does not include arsenic.
- (last para.) - Please recheck the "upstream" and "downstream" designation regarding the surface water/sediment samples.

Response:

Agree. The "1987/1988" wells were installed by USGS. Section 2.1 describes work conducted by NUS and documented in the RIIR Report. As discussed during the December 13, 1995 Partnering Team teleconference, additional text concerning the installation of the USGS wells will be added to the RI Report.

According to the RIIR Report, arsenic was a groundwater parameter. Arsenic will be added to footnote 2 on Table 4-5.

The "upstream" and "downstream" designations are incorrect and are reversed. The text will be revised accordingly.

13.

**Page 2-13:**

- (3rd para.) - Analytical program referenced for well 10GW36 in this paragraph does not coincide with Table 4-5.
- (4th para.) - "The sediment samples were analyzed for TCL volatiles, TAL metals, and TOC." (TOC is not shown on Table 4-16.)

Response:

The text on page 2-13 is correct. Table 4-5 will be revised to be consistent with the text.

TOC will be added to Table 4-16.

14.

**Pages 2-20 & 21: (Section 2.5.2) - Indicate that these soil borings performed were located in the areas of the sludge pits. Need to provide information on the depth of these sludge pits, and the depth to which soils were previously excavated. "The depth of the soil borings ranged from 6 to 14 feet beneath the ground surface." Were the soil samples that were collected from this depth located beneath the backfilled soils?**

Response:

According to the "Evaluation and Recommendation: Unit 10 Former Sludge Impoundment Area" report the impoundment area was excavated to approximately 9.5 feet below the existing ground surface. It was backfilled and covered with 2 feet of clay and 2 feet of topsoil. Therefore, a depth of 6 feet would be within the backfill soils and a depth of 14 feet would be slightly (0.5 foot) beneath the backfill soils. As discussed during the December 13, 1995 Partnering Team teleconference, the text in this section (and elsewhere, as appropriate) will be expanded to indicate whether samples were collected from fill material or beneath the backfilled soils.

15.

**Page 2-27: (last para.) - Need to provide the dates that water levels were measured with regard to the dates that groundwater samples were collected.**

Response:

Water-level measurements are discussed in Section 2.6.9 and Table 2-4. According to Table 2-4, water levels were measured on 10/8/94 and 10/31/94. According to the groundwater sample log sheets in Appendix C.1, the wells were sampled between 9/20/94 and 9/27/94. The text in Section 2.6.4 will be expanded to include the dates of groundwater sampling.

- 16. Page 2-31: (3rd para.) "The groundwater was purged until visibly clean prior to collection of the gasoline-range organic sample." Please clarify. Was the groundwater turbid or was product present.**

Response:

This statement is incorrect. None of the groundwater samples collected in 1994 for OU2 were analyzed for gasoline-range organics, diesel-range organics, or oil and grease. Therefore, the sentence in question will be deleted from the report, and references to these analytes will be deleted from the document. Floating product was not present in any groundwater samples collected during this B&R Environmental 1994 sampling event or, to the best of our knowledge, during any other sampling event at OU2.

- 17. Table 2-4: Need to include hydropunch/temporary wells in this table. Also the measure point elevation for OU2MW10 does not correspond with the information in Table 2-1.**

Response:

The water levels in the Hydropunches/temporary wells were measured at the time they were sampled, but the levels were not measured with the other wells on 10/8/94 and 10/31/94. Therefore, water-level information for the temporary wells is not appropriate for Table 2-4.

According to the Monitoring Well Construction Sheet for well OU2MW10, the top riser elevation is 18.17 feet. The elevation is correct on Table 2-1 and incorrect on Table 2-4. Table 2-4 will be revised to include the correct top of riser elevation. The water-level measurements are correct.

- 18. Page 2-40: (3rd para.) - "All sampling equipment was decontaminated according to the procedures detailed in Section 2.6.6." Correction bolded (change "2.5.6" to "2.6.6").**

Response:

Text will be changed to correct this typographical error.

- 19. Page 3-2: (2nd para.) - Provide information regarding classification of Turkey Gut.**

Response:

Text will be changed to indicate that Turkey Gut is a "Class C" surface water.

- 20. Page 3-15: (1st line) - The negative "-" sign needs to be attached to 23.2 feet MSL.**

Response:

Agree. Text will be changed.

- 21. Page 3-24: (Section 3.7) - Provide reference map which designates the street names and the areas discussed in the last 2 paragraphs of this section (housing, Community Services complex, and Ordnance and Survival Training areas).**

Response:

Do not agree that a map is needed in the report. The text will be revised to indicate the direction and distance between these areas and OU2. This will indicate that conditions at OU2 would not adversely impact these areas. In addition, a statement that no activity currently occurs at OU2 will be added. As discussed during the December 13, 1995 Partnering Team teleconference, Gary McSmith will provide a map of the Air Station to Linda Raynor. The map will not be required for the RI Report.

- 22. Page 3-25: (2nd para.) - "The Tidal Freshwater Marsh..."** Correction bolded (change March to Marsh).

Response:

Agree. Text will be changed.

- 23. Page 3-26: (4th and 5th para.) - Re: fish discussions - Does Turkey Gut contain fish? If so, need to mention here. Also, need to elaborate somewhat on the external lesions noted on the fish. What is the suspected cause of these lesions?**

Response:

According to Page 7-13, Section 7.1.4.7, fish, frogs, and aquatic insects were observed in Turkey Gut during the field activities for the Ecological Risk Assessment. This information will be added to the text in question.

The statement on fish lesions was taken from the Fleming and Hightower report titled "A Biological Evaluation of Metal Contamination in Slocum Creek, North Carolina" that is provided in Appendix K.3. A review of this report did not contain an explanation of why there were lesions, only that they were present. As discussed during the December 13, 1995 Partnering Team teleconference, all references to fish lesions will be removed from the report. See response to Gary McSmith Comment 25.

- 24. Page 4-11: (2nd para.) - Please clarify sentence beginning "The next investigation of soil..." Also, in the same paragraph, "Three of these samples were also analyzed for TCL..." (Only two samples are indicated in Table 4-1.)**

Response:

The sentence will be split into two sentences as follows: "The next investigation of soil in this area consisted of four soil borings drilled within the former sludge impoundments to confirm that the 1983 closure was successful. During the 1983 cleanup of the impoundments, no analysis for specific organic compounds was conducted."

Table 4-1 is correct. The text will be changed to conform with Table 4-1.

- 25. Table 4-3: Numerous errors were noted in this table, therefore, please recheck all entries and correct discrepancies. A few to mention are the errors in the frequency of detection for volatiles (as well as the other analytes), need to provide units for pesticides/PCBs, concentrations (sic) ranges are incorrect for 4,4'-DDD and selenium, just to name a few. Also,**

the footnote indicates that data from 44ASO03-0000 and 44ASO04-0000 were included in this table, however, the data section in Appendix H.2, page 51, for these two samples is blank. Also, where is the data for duplicate sample SS-09D?

Response:

Agree. Will correct errors. The following corrections will be made based on a comparison of the data in Appendix H:

- Fourteen of the surface soil samples were analyzed for volatile organics.
- 4,4'-DDD: Range 3.8 - 4.3; Frequency 2/11
- 4,4'-DDE: Range 4.2
- Dieldrin: Range 8.1 - 11; Frequency 2/11; Maximum OU2SS01-0001
- Endrin aldehyde: Range 2.3 - 27
- Chromium: Range 2.6 - 51.2
- Copper: Range 1.5 - 50.8; Frequency 15/16
- Lead: Frequency 14/16
- Magnesium: Range 236 - 2,180; Frequency 11/14
- Silver: Range 0.43 - 3.7; Frequency 2/16

None of the maximum detected concentrations increased from correction of the above errors; some of the maximum detected concentrations decreased slightly.

The concentration range for selenium in Table 4-3 is correct.

→ Data for 44ASO03 and 44ASO04 are presented on Page 79 in Appendix H.2.

→ The results for SS-09D are missing and will be added to the database.

Units will be provided for pesticides/PCBs.

26. **Page 4-18:** (1st para.) - "The subsurface soil sampling program was far more extensive than the surface soil program. It included 128 samples at depth (sic) ranging from 2 to 26 feet. All of this sampling occurred in the surficial sediments." Please clarify underlined portion.

Response:

This sentence will be deleted.

27. **Page 4-25:** (2nd para.) "The highest concentrations of TCE, which ranged from 800 to 880 ug/kg in three samples, were noted in the soil samples collected from the former sludge impoundment and in Study Area B." Add (un)bolded text. (Plate 9 indicates this is the case.)

Response:

Agree. Text will be added.

28. **Page 4-38:** (2nd para.) - "This work consisted of sampling 18 existing wells...and two Hydropunch installations for TCL..." (See HP-3 data - "two" hydropunches does not appear to be correct.



Response:

Agree. The text will be revised to indicate that three Hydropunch installations were analyzed for TCL organics (and TAL metals), and three Hydropunch installations were only analyzed only for TCL volatile organics (and TAL metals).

29. **Table 4-5: Please check entries for 10GW36 and information presented for OU2HP1 through OU2HP4-D (this information does not correspond with the text on page 4-38).**

Response:

Table 4-5 is correct with respect to the wells identified. However, the text on Page 4-38 is incorrect. The text will be revised to indicate that 19 existing wells (rather than 18 existing wells) were analyzed for full TCL organics.

30. **Table 4-6: Re: Background groundwater analytical results - Data collected from contaminated areas (such as HP-1 and HP-2, which are located in areas of contaminated soils and groundwater) should not be retained as background levels. Background levels should be obtained from areas basically free of any contamination.**

Response:

Background locations HP-1 and HP-2 are different than locations OU2HP1 and OU2HP2. Background groundwater sampling locations are presented on Figure 2-2 and Plate 3. A reference to this figure and plate will be added to Section 4.2.2 (Background Groundwater Quality).

31. **Page 4-52: (4th para.) Please clarify the underlined portion: "Since the source material (i.e., the sludge) has been removed, no significant source materials (sic) remains, and plume washout is evidenced by these data points."**

Response:

The sentence will be revised as follows "...plume washout is indicated by these data points that show a general decrease in contaminant concentrations over time (see Table 4-8)."

32. **Page 4-54: (1st para and Table 4-9) - According to the North Carolina Groundwater Quality Standards (NCAC, Title 15A, Subchapter L, Section .0202(c)), "Except for tracers used in concentrations which have been determined by the Division of Epidemiology to be protective of human health, and the use of which has been permitted by the Division, substances which are not naturally occurring and for which not standard is specified shall not be permitted in detectable concentrations in Class GA or Class GSA groundwaters." Therefore, Table 4-9 should include all chemicals that were detected, even if no numerical standard is given in the regulations; detections are still considered to be exceedances of the groundwater quality standards. Please adjust text and Table 4-9 accordingly and specify if this change will affect the results of the risk assessments performed in any way.**

Response:

Agree. The changes will be made to Table 4-9, other tables that compare groundwater

concentrations to state groundwater standards, and the text, as appropriate. These revisions will not affect the baseline human health risk assessment, as the state groundwater quality standards are not used to define risk. Risk values are calculated using Cancer Slope Factors (CSFs) for carcinogens and Reference Doses (RfDs) for noncarcinogens.

33. Page 4-54: (2nd para.) - Change "These areas are located west..." to "One area is ..."

Response:

Agree. Text will be changed.

34. Tables 4-11 and 4-12: Shading is too faint to easily determine exceedances of state standards.

Response:

Agree. Unfortunately, this occasionally occurs during large volume copying, which is the case for this document. However, the standards are provided in the tables. In addition, where there is no numerical standard for an organic compound, a footnote will be added to these tables (and other tables as appropriate) that indicates any detection is considered an exceedance of the state standard. As discussed during the December 13, 1995 Partnering Team teleconference, exceedances in these (and other) tables will be indicated by an asterisk. This will avoid the potential problem of faint shading.

35. Page 4-74:

(1st para.) Provide information regarding the classification of Turkey Gut.

(2nd para.) "The maximum detected concentration was 0.28 ug/l." For what parameter?

(3rd para.) Please elaborate somewhat on the following: "Antimony and copper were only detected in single filtered samples (an occurrence that can result from calcium interference in the analytical process)." This paragraph also indicates that surface water concentrations were compared to drinking water standards; whereas they should be compared to surface water standards. Revise as necessary.

Response:

The first paragraph will be revised to indicate that Turkey Gut is a Class C surface water.

The second paragraph will be revised to indicate that the maximum detected concentration was for 4,4'-DDD and will refer the reader to Table 4-14.

In the third paragraph, the statement "(an occurrence...analytical process)" will be removed to avoid confusion. In addition, the comparison to drinking water standards was made because groundwater from the surficial aquifer is known to discharge to Turkey Gut. A column showing state surface water standards will be added to Table 4-14, Summary of Analytical Results - Turkey Gut Surface Water, and other tables that present surface water data, as appropriate. Analytical parameters that exceed surface water quality criteria will be identified in the appropriate text sections.

36. Tables 4-14 and 4-15: These tables should include surface water quality standards and the exceedances should be denoted. Turkey Gut should be viewed as a Class "C" surface water

and Slocum Creek as Class "SC" with the standards applied accordingly.

Response:

Agree. Columns presenting the appropriate standards will be added to Tables 4-14 and 4-15, and exceedances will be denoted by shading.

- 37.** Page 4-81: (last para.) "In contrast to the surface water results presented for Turkey Gut (four low...)" Should this be three? (Table 4-14 lists 3.)  
Also, "Three of the pesticides listed (4,4'-DDT, endosulfan II, and endrin aldehyde) were reported at maximum concentrations below 1 ug/kg." Table 4-17 indicates that heptachlor should also be counted. Need to recheck data and revise accordingly.

Response:

Agree. Text will be revised accordingly.

- 38.** Table 4-19: Need to provide a footnote for the TCL organics heading to indicate which parameters are included, i.e., volatiles, semi-volatiles, etc.

Response:

A footnote will added that indicates that TCL organics includes volatiles, semivolatiles, and pesticides/PCBs.

- 39.** Tables 4-23, 4-25, and Table 4-3: Discrepancies noted regarding semivolatile organics. Table 4-25 includes 2,4-Dichlorophenol and 4-Nitrophenol, however, neither Table 4-3 (surface soils) nor Table 4-23 (leachate seep sediment) includes these parameters. Please revise as necessary.

Response:

Table 4-23 is incorrect; it will be revised to show all analytes that were detected.

- 40.** Table 4-24: Shouldn't this heading read "Polishing Ponds' Sediment/Soil?"

Response:

The title of this table will be revised to read "Polishing Pond Sediment/Soil.

- 41.** Table 4-25: Maximum value listed for dieldrin in this table conflicts with Table 4-3.

Response:

The correct concentration range for dieldrin in Table 4-3 (surface soil) is 8.1 to 11  $\mu\text{g/kg}$  (see response to Linda Raynor Specific Comment 25). The concentration range for dieldrin in Table 4-23 (leachate seep sediment) is ND to 20  $\mu\text{g/kg}$ . Therefore, the maximum concentration provided in Table 4-25 (20  $\mu\text{g/kg}$ ) is correct.

- 42.** Page 4-102: (2nd para.) "This section focuses on samples collected from depths of 0 to 10

feet, which are the samples used in the risk assessment." Does this data apply for construction workers only? If so, this needs to be stated.

Response:

These data were used only for the construction worker. This will be added to the text.

43.

**Pages 4-106-109:** The summary discussions on groundwater contamination in the surficial and Yorktown aquifers is based on 1994 analytical data. Using 1994 data to reflect current groundwater conditions is acceptable as long as the 1994 data collection points adequately cover the site and address all previously detected areas of groundwater contamination. Were there any locations where groundwater contamination was detected in previous sampling events that were not addressed with the 1994 sampling event? If so, the previous sampling data should be used to reflect the groundwater plume delineation in those areas (and be included in evaluating risks). The text on these pages should include discussions to address this comment.

Response:

The intent of this summary (in Section 4.7) is to "set the stage" for the baseline human health risk assessment. Although there have been many rounds of groundwater sampling conducted at OU2 over the years, only the 1994 data for the surficial aquifer and Yorktown aquifer, which were selected as that which is most representative of current site conditions, are used for risk assessment purposes. It would not be appropriate to use data collected in 1990 (or before) to establish current, baseline conditions. As stated in Section 6.1.2, historical data were not used for the following reasons: (1) the 1994 samples were collected using the most appropriate sampling technique (low-flow purge and sample), (2) the 1994 results are most representative of current site conditions, (3) the suite of analytes measured in 1994 was the most comprehensive, and (4) all 1994 data are subject to validation.

44.

Section 4.2.3 (surficial aquifer) and Section 4.2.4 (Yorktown aquifer) discuss the results from the most recent sampling event (either 1990 or 1994). The majority of the wells that were sampled prior to 1990 were also sampled in 1990 and/or 1994. This is the case except for surficial aquifer wells 10GW18, 10GW25, and 10GW30 and Yorktown aquifer well 10GW26 (as presented in Table 4-5). These surficial aquifer wells are within areas of contamination that are known to exceed state groundwater standards (Figure 4-6 and Plate 13). For well 10GW26, lead (18  $\mu\text{g/L}$ ) and bis(2-ethylhexyl)phthalate (14  $\mu\text{g/L}$ ) exceeded these standards (Figure 4-7 and Plate 14, which will be revised to show the exceedance for lead). The figures and plates that show the extent of contamination in the surficial and Yorktown aquifers were based on 1994 data, if available. If 1994 data were not available for a well, then 1990 data were used. This will be added to the text.

44.

**Page (sic) 4-109-114:** Surface water discussion should compare upstream results to those collected adjacent to the landfill areas and to downstream samples collected. For example, for each stream, which chemicals appeared to increase with downstream flow? In addition, surface water results need to be compared to surface water quality standards, and exceedances should be denoted in the tables.

Response:

In Turkey Gut, there is no pattern or trend in the detected concentrations. For some analytes (e.g., aluminum and zinc), the highest concentrations were detected in the most upstream sample (OU2SW5). For other parameters (e.g., most organics), the highest concentrations were detected in OU2SW6 and OU2SW4, between the upstream sample and the sample nearest Turkey Gut. Location OU2SW3, located just before Turkey Gut enters Slocum Creek, generally contained lower contaminant concentrations than OU2SW4 and OU2SW6. Surface water quality standards (Class C) will be added to Table 4-29. It should be noted that there are no surface water quality standards for most of the detected analytes. Copper and iron exceeded the Class C action level in all samples. These were the only exceedances.

In Slocum Creek, there is no pattern or trend in the detected concentrations. The highest concentrations were detected in the background sample (OU2SW1), the sample upstream of Turkey Gut (OU2SW2), or the sample downstream of Turkey Gut (OU2SW07). Surface water quality standards (Class SC) will be added to Table 4-30. It should be noted that there are no surface water quality standards for most of the detected analytes. Copper exceeded the Class SC action level in all samples. This was the only exceedance.

- ☛ The text will be revised to indicate that there is no general pattern or trend in contaminant distribution in either surface water body.

**45. Page 114 (sic): (5th para.) Typo in third line.**

Response:

For the text in question "...s, 4,4'-DDD..." the "s, " will be deleted.

**46. Page 6-6: (3rd para.) - Re: Data Evaluation - "All existing data for soil and sediment were used for the assessment; only 1994 data were used to evaluate potential risks for exposure to groundwater and surface water." As stated in specific comment 43 above, using 1994 data to evaluate groundwater (and surface water) is acceptable as long as no other areas of contamination have been identified by previous sampling events that are left unaccounted for by the 1994 investigation.**

Response:

Groundwater - See response to Linda Raynor Specific Comment 43.

Surface water - There are no other areas of contamination that have been identified by previous sampling events that are left unaccounted for by the 1994 investigation.

The text will not be changed.

**47. Figure 6-2: Should the Vehicle Maintenance Area (Hobby Shop) be added to this figure?**

Response:

Yes. The Hobby Shop (Site 76) will be added to this figure and throughout the document, as appropriate.

**48. Table 6-2: Are there any full-time employees currently on this site? What about the Hobby**

**Shop personnel, if this site is to be included in OU2? Please revise as necessary.**

Response:

There are no full-time employees at OU2 (including the Hobby Shop). The Hobby Shop is used by Air Station personnel for the maintenance and repair of private vehicles. Risks to such personnel would be the same (or less) than those for the future full-time employee evaluated in the RI Report.

- 49. Page 6-20: (2nd para.) - "Volatile organic compounds that were retained as COPC are not found in soils less than 2 feet deep." Add (un)bolded text.**

Response:

Agree. The text will be added.

- 50. Page 6-27: (bulleted items) Why is the child recreational user not being evaluated?**

Response:

The recreational user was defined in Table 6-2 as being exposed to Slocum Creek during fishing, swimming, or boating. Children are defined in the risk assessment as ages 6 and under. These small children are not likely to spend a great deal of time swimming, boating or fishing.

- 51. Page 6-59:**  
- (2nd para.) - Need to add information of classification of Turkey Gut.  
~~(4th para.)~~ - "No state surface water quality standard (SC) exceedances were noted." This is an incorrect statement and should be deleted. Copper concentrations detected in Slocum Creek (23.0 - 37.0 (filtered)) exceed the standard of 3 ug/l. For Turkey Gut, iron and copper concentrations exceed the water quality standards for Class "C" streams. Note: Other exceedances may also exist; need to recheck data.

Response:

Turkey Gut will be identified as a Class C surface water.

The text will be revised to indicate that no state surface water quality standards for the protection of human health were exceeded. The reviewer is correct in that "action levels" were exceeded. According to NCAC, Title 15A, Section .0211(b)(4), which provides action levels for Class C fresh surface water, substances listed in Subparagraph 4 (e.g., copper and iron) are "generally not bioaccumulative and have variable toxicity to aquatic life..." The same statement is made in NCAC, Title 15A, Section .0212(b)(4), which provides action levels for Class SC tidal salt water. Based on these regulations, the interpretation was that the action levels for Class C and Class SC surface water were established for the protection of aquatic life, rather than for the protection of human health. Section 6 of the RI Report is the Baseline Human Health Risk Assessment, and it would not be appropriate to discuss exceedances of water quality standards based on the protection of aquatic life.

- 52. Page 6-61: (2nd para.) - Trespassers need to be added to the evaluation for future land use**

conditions. (Table 6-2 includes trespassers but this text does not.)

Response:

Current and future risks for the adolescent trespasser are the same. Nothing about the exposure scenario, exposure concentration, or receptor characteristics would differ between current and future site conditions. The future adolescent trespasser will be added to the second and fourth paragraphs.

- 53. Page 8-1: (3rd para.) - Need to revise according to specific comment 1 above.**

Response:

Agree. Text will be revised in accordance with the response to Linda Raynor Specific Comment 1.

- 54. Page 8-6: (1st para.) - Add "and for constructions workers" to the end of this sentence.**

Response:

Do not agree. The cancer risk for the construction worker is  $2.6E-6$ , which is within EPA's acceptable risk range of  $1E-4$  to  $1E-6$ . Although the overall HI (1.2) exceeds 1 (Table 6-12 and page 6-65), not all of the COPCs affect the same target organ. As stated on page 6-66 (paragraph 2), "...the total target organ HI is below (1.0)...Therefore, it can be assumed that no adverse health effects would be experienced by a construction worker."

- 55. Page 8-7: Re: RGOs: Summarize which exposure scenarios provide the most stringent remedial goal options (RGOs) vs. the highest RGOs.**

**NOTE: When determining soil cleanup levels, for this site, or any site, it must also be demonstrated that the proposed soil cleanup levels will be protective of the groundwater.**

Response:

- The 30-year (worst case) future resident has the most stringent (lowest) RGOs, and the construction worker has the least stringent (highest) RGOs. This statement will be added to the text.

Soil cleanup levels that are protective of groundwater will be evaluated in the Feasibility Study. In addition, as discussed during the December 13, 1995 Partnering Team teleconference, "hot spot" soil areas that need to be evaluated during the FS will be identified in the RI Report.

- 56. Appendix H.2., page 51: Soil data is missing for sample locations 44AS003-0000 and 44AS004-0000.**

Response:

These data appear on Page 79 of Appendix H.2. The entry with blank spaces will be deleted from the database.

57. **Appendix H.4, page 1:** Should the first sample be 10GW23 rather than 10EGW23?

Response:

This is correct. The analytical database, text, figures, and plates will be checked to ensure that consistent sample designations are used throughout the report.

58. **Appendix L:** The soil gas survey maps indicate a "hot spot" is located in the vicinity west of well number 57 (a pre-1981 well that is shown on Plate 2), however, it does not appear that any investigations were ever conducted in this area. Please explain.

Response:

This was discussed during the December 13, 1995 Partnering Team teleconference. It is not known why this area was not further studied. Groundwater in this area contains organic compounds. There was a team consensus on the unreliability of soil gas surveys, except as a screening tool. The team decided that if additional data are needed, such data could be collected during the design phase of a remedial action.

59. **Plate 2:** Plate 2 is very crowded with information. Perhaps two separate plates should be prepared to show sample locations, one for soil samples (surficial, subsurface, and dry leachate and sediment) and one for water samples (groundwater, surface water, leachate water and staff gages) Also, sample locations TP-8 and SS-03 (Study Area B) are missing and SS-04 is mislabeled as SS64.

Response:

The missing sample locations will be added to Plate 2 (and corresponding Figure 2-1). One of the purposes of Plate 2 (and Figure 2-1) is to show the large number of sampling locations at OU2. The figures (and plates) provided in Section 4 that show areas of soil and groundwater contamination show less information, and are not as crowded. Therefore, separate maps will not be provided. Also, see Gena Townsend General Comment 10 and response.

60. **Plate 13:** Is this plume map based on all groundwater data collected under the IRP program, or just on the 1994 data? Please provide notation on this plate to clarify this question. Also, the clean wells used to delineate the boundaries of the plume should be identified on this plate, and the corresponding analytical data (and sampling dates) should be presented in the Appendix. For example, what wells were used to determine the northern and southern (especially south of HP-6) boundaries of this plume.

Response:

The areas of groundwater contamination on Plate 13 (and Figure 4-6) are based on the most recent analytical data for a particular monitoring well. In most cases, this would be 1990 or 1994 data; however, in some cases, earlier data were used. A notation will be provided on Plate 13 and Figure 4-6. The western plume boundary was defined by Slocum Creek, except for the area near 10GW04. The results for 10GW04, which was last sampled in 1990, are provided in Appendix H.4. The eastern plume boundary was based roughly on the location of the fence. For the north plume boundary, 10EGW20 was used to define the "clean" area near the northeast corner of the plume. The results for 10EGW20, which was last sampled in



1990, are provided in Appendix H.4. Locations 10GW31 and 10GW32 were also used to define the northwestern boundary. The results for 10GW31 and 10GW32, which were last sampled in 1994, are also included in Appendix H.4. The northern boundary was also approximated based on the groundwater flow directions and the groundwater mounding in the area of Site 46 depicted on Plate 6 and Figure 3-5. Location OU3MW5, north of Site 46, was also "clean". These results will be added to the database. The southern boundary was estimated based on the results for 10GW38 and 10GW39, both of which were sampled in 1994. Again, these results are presented in Appendix H.4. There are no data points south of 10GW40 or OU2HP06; therefore, the boundary in these areas is somewhat speculative.

It should be noted, that except for OU3MW5 well, all wells used to delineate the approximate areas of the plume (as noted in the title of the plate) were identified on the plate in question. In addition, all available data were used in the presentation of data on this plate.

During the December 13, 1995 Partnering Meeting teleconference, there were additional concerns raised because there are no monitoring wells located east of Roosevelt Boulevard. Based on B&R Environmental review of historic aerial photographs and the direction of groundwater flow, there is no reason to assume an upgradient source of groundwater contamination east of Roosevelt Boulevard. The team consensus was that if additional groundwater data are needed, such data can be collected during the design phase (if groundwater remediation is selected). There are sufficient data to evaluate remedial alternatives and to estimate risks.

**62.** **Plate 14:** Does the groundwater contamination information presented on this plate represent all groundwater data collected under the IRP program, or just the 1994 data? Please provide notation on this plate to clarify this question.

Response:

The areas of groundwater contamination on Plate 14 (and Figure 4-7) are based on the most recent analytical data for a particular monitoring well. This will be noted on the plate and figure. It should be noted that some of the wells identified on this plate and figure are surficial aquifer wells, rather than Yorktown aquifer wells (e.g., 10EGW07, 10EGW08, and 10GW16). Plates 13 and 14, and the corresponding figures, will be revised as necessary.

**63.** **Plate 15:** Please place notation on this plate to indicate which areas are considered to be wetlands. (If the Mesic mixed hardwood forest area is considered to be the wetland boundary, this should be denoted on the plate.)

Response:

The only wetland identified on Plate 15 (and corresponding Figure 7-1) is the Coastal Plain Small Stream Swamp. This will be noted on the text, but not on the plate and figure.

## COMMENTS FROM DAVID LILLEY, NCDEHNR

1. Table 4-2, page 4-13: For naturally occurring inorganics, 2 times the average site-specific background concentration, not the upper 95% confidence limit concentration, should be used to screen COPCs.

Response:

This was the same approach used for the OU3 RI Report. No written guidance was available from the USEPA on the comparison to background at the time the OU3 RI report was prepared. However, verbal guidance from Ted Simon indicated that a statistical comparison was not needed. His discussion did not indicate that the "two times background" method should be used. The analytical database was already set up to do a statistical comparison to 21 background soil samples collected from throughout the Air Station in areas known not have received waste deposits. Therefore, it was determined that while a statistical comparison was not needed, it was a simple step to perform and was, therefore, incorporated.

2. Table 4-2, page 4-13: It is unclear to the reader why chromium is missing from this table. According to Appendix H.1, was detected 20/21 times with a concentration range of 2-7 - 26.35 mg/kg. Please explain.

Response:

The results for chromium will be added to Table 4-2.

3. Table 4-3, page 4-16: According to this table 4,4'-DDD was found in one sample (OU2SS04-0001) at 43 ug/kg. However, according to Appendix H.2, 4,4'-DDD was also found in sample OU2SS01-0001 at 3.8 ug/kg. Please explain.

Response:

The table will be corrected by adding the missing result to the concentration range and frequency of detection columns.

4. Page 4-47, Table 4-6: According to Appendix H.3, the concentrations for calcium for HP-1 should be 2275 (total), and 2305 (dissolved), not 2777 and 2350 as appears in this table.

Response:

The typographical errors will be corrected in Table 4-6.

5. Appendix H.4: It is unclear to the reader which of these samples had been used in this risk assessment. Please explain.

Response:

As stated on Page 6-10, Section 6.1.2, 1st paragraph, risk evaluation for groundwater was performed using 1994 data.

6. Page 6-13, Figure 6-2: It is unclear to the reader why adolescent trespassers and recreational adults can be exposed by dermal contact and incidental ingestion to sediment, but adult and

child residents cannot. Please explain.

Response:

The goal of the risk assessment is to provide the readers and reviewers with a range of potential risks as experienced by a variety of receptors. The intent is to define, at a bare minimum, the worst-case scenario, which is some sort of future residential land use (either the 6-year scenario or the 30-year scenario that is footnoted), as well as some sort of intermittent exposures. It is not possible to envision every possible permutation and combination of exposure routes and receptors; therefore, a range of receptors is provided. Of course, that is not to exclude the possibility that Receptor A could do all or some of the activities defined for Receptor B and, therefore, increase Receptor A's risk. If anything, this could be addressed in the uncertainties section of the risk assessment.

Adding more intermittent receptors does not add significance to the risk assessment. The receptors already identified adequately defines the range of potential risks. The Feasibility Study will evaluate remedial options for those receptors and exposure scenarios where risks are "unacceptable" or exceed a benchmark value. Sites are not generally remediated for protection of intermittent receptors, unless no other receptors are identified.

The following rationale was used in the definition of receptors and exposure routes:

- Child residents (defined as children under the age of 6) are unlikely to be exposed either frequently or regularly (during this age range) to sediment in surface water bodies. It is assumed that children under the age of 4 would probably never be exposed (these are natural water bodies without gently sloping banks for access by small children, leaving exposures to maybe occur over a 2-year period (versus the 9 years evaluated for adolescents. Therefore, the risks would be minimal.
- Adult residents could theoretically be exposed to surface water, leachate, fish, etc. However, the most likely adult resident is defined as living on site for a period of 6 years (2 tours of duty). Exposures under the adult recreational scenario include local (off property) residents who could be exposed over a period of 30 years. Therefore, the risks to onsite residents would be less than those estimated for the recreational adult receptor, although it would certainly be possible to prorate the recreational user risks for a 6-year duration and add it to the residential risks. It should be noted that "unacceptable" risks have already been estimated for the future resident under the exposure scenarios evaluated.

The risk exposure scenarios will not be revised.

7.

Page 6-13, Figure 6-2: It is unclear to the reader why a recreational adult can be exposed to surface water/leachate via dermal contact, incidental ingestion, and fish ingestion, and an adolescent trespasser can be exposed to surface water/leachate via dermal contact and incidental ingestion, but adult and child residents cannot. Please explain.

Response:

See response to David Lilley Comment 6.

8. **Page 6-13, Figure 2:** It is unclear to the reader what the difference between a (1) and a blank space is for the inhalation route. Please explain.

Response:

A blank space indicates that a particular receptor is not exposed to that particular medium, as for all other receptor/exposure route blank spaces. a "(1)" indicates that the exposure would be minimal, as indicated by the note for this parameter.

9. **Page 6-35:** It is recommended the current EPA Region IV guidance on exposure to VOCs during exposure to showering be followed. This guidance states that it should be assumed that showering exposure is equivalent to exposure from ingestion of two liters of contaminated water per day. This method includes exposure via inhalation and dermal routes and is applied to adults and children.

Response:

A copy of the Risk Assessment Forum's guidance on exposure to VOCs during showering was available to the contractor. However, since compounds other than VOCs are significant in the groundwater at OU2, a model other than the simplistic assumption of inhalation plus dermal equals ingestion must be applied for those compounds. In fact, the results of the model used are within the "order of magnitude plus or minus a factor of three" mentioned in this guidance. The simplistic guidance recommended would result in the fairly uneven application of slope factors and Reference Doses to compounds that may or may not exhibit toxic or carcinogenic effects by one route or another. It is easy enough to revise the risk spreadsheets and simply multiply the ingestion results by a factor of two and add this number to the results for other chemicals of potential concern (metals, PAHs, etc.) that are also dermally absorbed. The risk calculation spreadsheets would then have to be modified to not use inhalation and dermal CSFs and RfDs for VOCs, which could then result in confusion and additional comments if reviewed in detail.

It should be noted that the risk assessment methodology used in the Draft OU2 RI Report already shows "unacceptable" risks for the future residential scenario; therefore, the risk assessment will not be revised.

10. **Page 6-41, Table 6-8:** It is recommended the current EPA Region IV guidance on fish consumption be followed. This guidance states that default fish ingestion should be considered at 54 g/day in combination with an exposure frequency of 350 days/year unless a site specific fish ingestion study has been performed.

Response:

The guidance to which the reviewer is referring was either not available or was not known to exist at the time of report preparation. Region IV risk personnel were contacted in March 1995 and no mention of this issue was made by either part at that time. The same values were used in the OU3 risk assessment, and no comments were received on this subject. This guidance will be requested in writing before any revisions are made. As long as the MCAS Cherry Point Partnering Team and their technical support staff are comfortable with this approach, the risk assessment could be modified for final submittal. This would, however, result in an inconsistency with the approach used for the OU3 RI.